

DAFTAR PUSTAKA

- Arkles, J. S., Opotowsky, A. R., Ojeda, J., Rogers, F., Liu, T., Prassana, V., Marzec, L., Palevsky, H. I., Ferrari, V. A., & Forfia, P. R. (2011). Shape of the right ventricular Doppler envelope predicts hemodynamics and right heart function in pulmonary hypertension. *American Journal of Respiratory and Critical Care Medicine*, 183(2), 268–276.
<https://doi.org/10.1164/RCCM.201004-0601OC>
- Attinà, T., Camidge, R., Newby, D. E., & Webb, D. J. (2005). Endothelin antagonism in pulmonary hypertension, heart failure, and beyond. *Heart (British Cardiac Society)*, 91(6), 825–831.
<https://doi.org/10.1136/hrt.2004.053991>
- Baliga, R. S., MacAllister, R. J., & Hobbs, A. J. (2011). New perspectives for the treatment of pulmonary hypertension. *British Journal of Pharmacology*, 163(1), 125–140.
<https://doi.org/10.1111/J.1476-5381.2010.01164.X>
- Balzer, D. (2012). *Current Status of Percutaneous Closure of Ventricular Septal Defects*. 2(2).
<https://doi.org/10.4172/2161-0665.1000112>
- Barst, R. J., Ertel, S. I., Beghetti, M., & Ivy, D. D. (2011). Pulmonary arterial hypertension: A comparison between children and adults. *European Respiratory Journal*, 37(3), 665–677.
<https://doi.org/10.1183/09031936.00056110>
- Barst, R. J., Gibbs, J. S. R., Ghofrani, H. A., Hoeper, M. M., McLaughlin, V. V., Rubin, L. J., Sitbon, O., Tapson, V. F., & Galie, N. (2009). Updated evidence-based treatment algorithm in pulmonary arterial hypertension. *Journal of the American College of Cardiology*, 54(1 Suppl).
<https://doi.org/10.1016/J.JACC.2009.04.017>
- Baumgartner, H., De Backer, J., Babu-Narayan, S. V., Budts, W., Chessa, M., Diller, G. P., Lung, B., Kluin, J., Lang, I. M., Meijboom, F., Moons, P., Mulder, B. J. M., Oechslin, E., Roos-Hesselink, J. W., Scherzmann, M., Sondergaard, L., & Zeppenfeld, K. (2021). 2020 ESC Guidelines for the management of adult congenital heart disease. *European Heart Journal*, 42(6), 563–645.
<https://doi.org/10.1093/eurheartj/ehaa554>
- Beitzke, D., Wolf, F., Edelhauser, G., Lammer, J., & Loewe, C. (2011). Right heart dilatation in adult congenital heart disease: imaging appearance on cardiac magnetic resonance. *The British Journal of Radiology*, 84(998), 188. <https://doi.org/10.1259/BJR/13711325>
- Beppu, H., Ichinose, F., Kawai, N., Jones, R. C., Yu, P. B., Zapol, W. M., Miyazono, K., Li, E., & Bloch, K. D. (2004). BMPR-II heterozygous mice have mild pulmonary hypertension and an impaired pulmonary vascular remodeling response to prolonged hypoxia. *American Journal of Physiology - Lung Cellular and Molecular Physiology*, 287(6 31-6), 1241–1247.
<https://doi.org/10.1152/AJPLUNG.00239.2004/ASSET/IMAGES/LARGE/ZH50120420410002.jpeg>
- Bhattacharya, D., Sasikumar, D., Gopalakrishnan, A., & Anoop, A. (2021). Ventricular septal defect with pulmonary arterial hypertension in an infant: Is there something more than what meets the eye? *Annals of Pediatric Cardiology*, 14(4), 554. [https://doi.org/10.4103/APC\(APC_226_20](https://doi.org/10.4103/APC(APC_226_20)
- Bisserier, M., Mathiyalagan, P., Zhang, S., Elmastour, F., Dorfmüller, P., Humbert, M., David, G., Tarzami, S., Weber, T., Perros, F., Sassi, Y., Sahoo, S., & Hadri, L. (2021). Regulation of the Methylation and Expression Levels of the BMPR2 Gene by SIN3a as a Novel Therapeutic Mechanism in Pulmonary Arterial Hypertension. *Circulation*, 144(1), 52–73.
<https://doi.org/10.1161/CIRCULATIONAHA.120.047978>

- Budhiraja, R., Tuder, R. M., & Hassoun, P. M. (2004). Endothelial Dysfunction in Pulmonary Hypertension. *Circulation*, 109(2), 159–165.
<https://doi.org/10.1161/01.CIR.0000102381.57477.50>
- Bunn, H. F. (2013). Erythropoietin. *Cold Spring Harbor Perspectives in Medicine*, 3(3).
<https://doi.org/10.1101/CSHPERSPECT.A011619>
- Chester, A. H., & Yacoub, M. H. (2014). The role of endothelin-1 in pulmonary arterial hypertension. *Global Cardiology Science and Practice*, 2014(2), 29. <https://doi.org/10.5339/gcsp.2014.29>
- Chinawa, J. M., Chukwu, B. F., Chinawa, A. T., & Duru, C. O. (2021). The effects of ductal size on the severity of pulmonary hypertension in children with patent ductus arteriosus (PDA): a multi-center study. *BMC Pulmonary Medicine*, 21(1), 1–8. <https://doi.org/10.1186/S12890-021-01449-Y/FIGURES/2>
- Cho, A. J., Kido, M., Wolf, P. L., Yuan, J. X., Ph, D., Deutsch, R., Ph, D., Jamieson, S. W., Thistlethwaite, P. A., & Ph, D. (2003). *Signaling Molecules in Nonfamilial Pulmonary Hypertension*.
- Correlation of Mean Pulmonary Arterial Pressure in Determination of Mortality in Dr. Sardjito Hospital Patients with Uncorrected Congenital Heart Defect.* (n.d.). Retrieved 19 December 2023, from <https://etd.repository.ugm.ac.id/penelitian/detail/185121>
- Cowan, K. N., Heilbut, A., Humpl, T., Lam, C., Ito, S., & Rabinovitch, M. (2000). Complete reversal of fatal pulmonary hypertension in rats by a serine elastase inhibitor. *Nature Medicine*, 6(6), 698–702. <https://doi.org/10.1038/76282>
- D'Alto, M., & Mahadevan, V. S. (2012). Pulmonary arterial hypertension associated with congenital heart disease. *European Respiratory Review*, 21(126), 328.
<https://doi.org/10.1183/09059180.00004712>
- Dinarti, L. K., Anggrahini, D. W., Lilyasari, O., Siswanto, B. B., & Hartopo, A. B. (2021). Pulmonary Arterial Hypertension in Indonesia: Current Status and Local Application of International Guidelines. *Global Heart*, 16(1). <https://doi.org/10.5334/GH.944>
- Dinarti, L. K., Hartopo, A. B., Kusuma, A. D., Satwiko, M. G., Hadwiono, M. R., Pradana, A. D., & Anggrahini, D. W. (2020). The COngenital HeART Disease in adult and Pulmonary Hypertension (COHARD-PH) registry: a descriptive study from single-center hospital registry of adult congenital heart disease and pulmonary hypertension in Indonesia. *BMC Cardiovascular Disorders*, 20(1). <https://doi.org/10.1186/S12872-020-01434-Z>
- Eichstaedt, C. A., Saßmannshausen, Z., Shaukat, M., Cao, D., Xanthouli, P., Gall, H., Sommer, N., Ghofrani, H. A., Seyfarth, H. J., Lerche, M., Halank, M., Kleymann, J., Benjamin, N., Harutyunova, S., Egenlauf, B., Milger, K., Rosenkranz, S., Ewert, R., Klose, H., ... Grünig, E. (2022). Gene panel diagnostics reveals new pathogenic variants in pulmonary arterial hypertension. *Respiratory Research*, 23(1). <https://doi.org/10.1186/S12931-022-01987-X>
- Evans, J. D. W., Girerd, B., Montani, D., Wang, X. J., Galiè, N., Austin, E. D., Elliott, G., Asano, K., Grünig, E., Yan, Y., Jing, Z. C., Manes, A., Palazzini, M., Wheeler, L. A., Nakayama, I., Satoh, T., Eichstaedt, C., Hinderhofer, K., Wolf, M., ... Morrell, N. W. (2016). BMPR2 mutations and survival in pulmonary arterial hypertension: an individual participant data meta-analysis. *The Lancet Respiratory Medicine*, 4(2), 129–137. [https://doi.org/10.1016/S2213-2600\(15\)00544-5](https://doi.org/10.1016/S2213-2600(15)00544-5)
- Farber, H. W., & Loscalzo, J. (2004). Pulmonary arterial hypertension. *The New England Journal of Medicine*, 351(16), 1655–1665. <https://doi.org/10.1056/NEJMra035488>

- Fernández, A. I., Yotti, R., González-Mansilla, A., Mombiela, T., Gutiérrez-Ibáñez, E., Del Villar, C. P., Navas-Tejedor, P., Chazo, C., Martínez-Legazpi, P., Fernández-Avilés, F., & Bermejo, J. (2019). The biological bases of group 2 pulmonary hypertension. *International Journal of Molecular Sciences*, 20(23), 1–19. <https://doi.org/10.3390/ijms20235884>
- Freund-Michel, V., Khoyrattee, N., Savineau, J. P., Muller, B., & Guibert, C. (2014). Mitochondria: Roles in pulmonary hypertension. *International Journal of Biochemistry and Cell Biology*, 55, 93–97. <https://doi.org/10.1016/j.biocel.2014.08.012>
- Frogoudaki, A. A., & Gatzoulis, M. A. (2018). Pulmonary arterial hypertension in congenital heart disease. *Continuing Cardiology Education*, 4(1), 23–33. <https://doi.org/https://doi.org/10.1002/cce2.74>
- Galiè, N., Humbert, M., Vachiery, J. L., Gibbs, S., Lang, I., Torbicki, A., Simonneau, G., Peacock, A., Vonk Noordegraaf, A., Beghetti, M., Ghofrani, A., Gomez Sanchez, M. A., Hansmann, G., Klepetko, W., Lancellotti, P., Matucci, M., McDonagh, T., Pierard, L. A., Trindade, P. T., ... Sirenko, Y. (2016). 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. *European Heart Journal*, 37(1), 67–119. <https://doi.org/10.1093/eurheartj/ehv317>
- Galiè, N., Manes, A., Palazzini, M., Negro, L., Marinelli, A., Gambetti, S., Mariucci, E., Donti, A., Branzi, A., & Picchio, F. M. (2008). Management of pulmonary arterial hypertension associated with congenital systemic-to-pulmonary shunts and Eisenmenger's syndrome. *Drugs*, 68(8), 1049–1066. <https://doi.org/10.2165/00003495-200868080-00004>
- Galiè, N., Saia, F., Palazzini, M., Manes, A., Russo, V., Bacchi Reggiani, M. L., Dall'Ara, G., Monti, E., Dardi, F., Albini, A., Rinaldi, A., Gotti, E., Taglieri, N., Marrozzini, C., Lovato, L., Zompatori, M., & Marzocchi, A. (2017). Left Main Coronary Artery Compression in Patients With Pulmonary Arterial Hypertension and Angina. *Journal of the American College of Cardiology*, 69(23), 2808–2817. <https://doi.org/10.1016/J.JACC.2017.03.597>
- Gard, E. K., Beale, A. L., Telles, F., Silvestry, F. E., Hanff, T., Hummel, S. L., Litwin, S. E., Petrie, M. C., Shah, S. J., Borlaug, B. A., Burkhoff, D., Komtebedde, J., Kaye, D. M., & Nanayakkara, S. (2023). Left atrial enlargement is associated with pulmonary vascular disease in heart failure with preserved ejection fraction. *European Journal of Heart Failure*, 25(6), 806–814. <https://doi.org/10.1002/EJHF.2805>
- Handoyo, Gunawijaya, E., & Yantie, N. P. V. K. (2023). Factors associated with the uncorrectable congenital heart disease in children with pulmonary arterial hypertension. *Medical Journal of Indonesia*, 32(1), 38–44. <https://doi.org/10.13181/mji.oa.236582>
- Happé, C., Kurakula, K., Sun, X. Q., da Silva Goncalves Bos, D., Rol, N., Guignabert, C., Tu, L., Schalij, I., Wiesmeijer, K. C., Tura-Ceide, O., Vonk Noordegraaf, A., de Man, F. S., Bogaard, H. J., & Goumans, M. J. (2020). The BMP Receptor 2 in Pulmonary Arterial Hypertension: When and Where the Animal Model Matches the Patient. *Cells*, 9(6). <https://doi.org/10.3390/CELLS9061422>
- Hartopo, A. B., Anggrahini, D. W., Dinarti, L. K., Schäfer, A. K., Bergmann, A., Fachiroh, J., & Somma, S. Di. (2023). Prognostic Value for Mortality of Plasma Bioactive Adrenomedullin in Patients with Pulmonary Arterial Hypertension: A Sub Analysis of the Biomarker Study in the COHARD-PH Registry. *Medicina 2023, Vol. 59, Page 748*, 59(4), 748. <https://doi.org/10.3390/MEDICINA59040748>
- Hassan, B. A., Albanna, E. A., Morsy, S. M., Siam, A. G., Al Shafie, M. M., Elsaadany, H. F., Sherbiny, H. S., Shehab, M., & Grollmuss, O. (2015). Nutritional Status in Children with Un-

- Operated Congenital Heart Disease: An Egyptian Center Experience. *Frontiers in Pediatrics*, 3. <https://doi.org/10.3389/FPED.2015.00053>
- Hilzendeger, A. M., Shenoy, V., Raizada, M. K., & Katovich, M. J. (2014). Neuroinflammation in Pulmonary Hypertension: Concept, Facts, and Relevance. *Current Hypertension Reports*, 16(9), 1–7. <https://doi.org/10.1007/S11906-014-0469-1/FIGURES/1>
- Hooper, M. M., Pausch, C., Olsson, K. M., Huscher, D., Pittrow, D., Grünig, E., Staehler, G., Vizza, C. D., Gall, H., Distler, O., Opitz, C., Gibbs, J. S. R., Delcroix, M., Ghofrani, H. A., Park, D. H., Ewert, R., Kaemmerer, H., Kabit, H. J., Skowasch, D., ... Rosenkranz, S. (2022). COMPERA 2.0: a refined four-stratum risk assessment model for pulmonary arterial hypertension. *The European Respiratory Journal*, 60(1). <https://doi.org/10.1183/13993003.02311-2021>
- Humbert, M., Kovacs, G., Hooper, M. M., Badagliacca, R., Berger, R. M. F., Brida, M., Carlsen, J., Coats, A. J. S., Escribano-Subias, P., Ferrari, P., Ferreira, D. S., Ghofrani, H. A., Giannakoulas, G., Kiely, D. G., Mayer, E., Meszaros, G., Nagavci, B., Olsson, K. M., Pepke-Zaba, J., ... Sivakumaran, K. (2022). 2022 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. *European Heart Journal*, 43(38), 3618–3731. <https://doi.org/10.1093/EURHEARTJ/EHAC237>
- Humbert, M., Morrell, N. W., Archer, S. L., Stenmark, K. R., MacLean, M. R., Lang, I. M., Christman, B. W., Weir, E. K., Eickelberg, O., Voelkel, N. F., & Rabinovitch, M. (2004). Cellular and molecular pathobiology of pulmonary arterial hypertension. *Journal of the American College of Cardiology*, 43(12 SUPPL.), S13–S24. <https://doi.org/10.1016/j.jacc.2004.02.029>
- Hye, T., Hossain, M. R., Saha, D., Foyez, T., & Ahsan, F. (2023). Emerging biologics for the treatment of pulmonary arterial hypertension. *Journal of Drug Targeting*, 31(5), 471–485. <https://doi.org/10.1080/1061186X.2023.2199351>
- Jing, Z. C., Xu, X. Q., Han, Z. Y., Wu, Y., Deng, K. W., Wang, H., Wang, Z. W., Cheng, X. S., Xu, B., Hu, S. S., Hui, R. T., & Yang, Y. J. (2007). Registry and survival study in Chinese patients with idiopathic and familial pulmonary arterial hypertension. *Chest*, 132(2), 373–379. <https://doi.org/10.1378/CHEST.06-2913>
- Jung, E., Won, H. S., Pil, R. L., Kim, A., & Park, I. S. (2007). Clinical implication of isolated right dominant heart in the fetus. *Prenatal Diagnosis*, 27(8), 695–698. <https://doi.org/10.1002/PD.1756>
- Kasahara, Y., Sakao, S., Tanabe, N., & Tatsumi, K. (2015). An epidemiological study of pulmonary arterial hypertension in Japan. *European Respiratory Journal*, 46, PA2105. <https://doi.org/10.1183/13993003.congress-2015.PA2105>
- Klinger, J. R., & Kadowitz, P. J. (2017). The Nitric Oxide Pathway in Pulmonary Vascular Disease. *American Journal of Cardiology*, 120(8), S71–S79. <https://doi.org/10.1016/j.amjcard.2017.06.012>
- Kowalczyk, A., Kleniewska, P., Kolodziejczyk, M., Skibska, B., & Goraca, A. (2015). The role of endothelin-1 and endothelin receptor antagonists in inflammatory response and sepsis. *Archivum Immunologiae et Therapiae Experimentalis*, 63(1), 41–52. <https://doi.org/10.1007/s00005-014-0310-1>
- Lammers, A. E., Bauer, L. J., Diller, G. P., Helm, P. C., Abdul-Khalil, H., Bauer, U. M. M., & Baumgartner, H. (2020). Pulmonary hypertension after shunt closure in patients with simple

- congenital heart defects. *International Journal of Cardiology*, 308, 28–32. <https://doi.org/10.1016/J.IJCARD.2019.12.070>
- Lane, K. B., Machado, R. D., Pauciulo, M. W., Thomson, J. R., Phillips, J. A., Loyd, J. E., Nichols, W. C., Trembath, R. C., Aldred, M., Brannon, C. A., Conneally, P. M., Foroud, T., Fretwell, N., Gaddipati, R., Koller, D., Loyd, E. J., Morgan, N., Newman, J. H., Prince, M. A., ... Wheeler, L. (2000). Heterozygous germline mutations in BMPR2, encoding a TGF- β receptor, cause familial primary pulmonary hypertension. *Nature Genetics* 2000 26:1, 26(1), 81–84. <https://doi.org/10.1038/79226>
- Levin, A. R., Frand, M., & Baltaxe, H. A. (2023). Left Atrial Enlargement. *Radiology*, 104(3), 615–621. <https://doi.org/10.1148/104.3.615>
- Lilyasari, O., Subekti, Y., Atika, N., Dinarti, L. K., Putri, S., Opitasari, C., Anggraini, A. B., Bussabawalai, T., & Teerawattananon, Y. (2019). Economic evaluation of sildenafil for the treatment of pulmonary arterial hypertension in Indonesia. *BMC Health Services Research*, 19(1), 1–9. <https://doi.org/10.1186/S12913-019-4422-5/TABLES/5>
- Liu, D., Liu, Q. Q., Guan, L. H., Jiang, X., Zhou, D. X., Beghetti, M., Qu, J. M., & Jing, Z. C. (2016). BMPR2 mutation is a potential predisposing genetic risk factor for congenital heart disease associated pulmonary vascular disease. *International Journal of Cardiology*, 211, 132–136. <https://doi.org/10.1016/J.IJCARD.2016.02.150>
- Ma, L., & Chung, W. K. (2017). The role of genetics in pulmonary arterial hypertension. *Journal of Pathology*, 241(2), 273–280. <https://doi.org/10.1002/path.4833>
- Machado, R. D., Aldred, M. A., James, V., Harrison, R. E., Patel, B., Schwalbe, E. C., Gruenig, E., Janssen, B., Koehler, R., Seeger, W., Eickelberg, O., Olschewski, H., Elliott, C. G., Glissmeyer, E., Carlquist, J., Kim, M., Torbicki, A., Fijalkowska, A., Szewczyk, G., ... Trembath, R. C. (2006). Mutations of the TGF- β type II receptor BMPR2 in pulmonary arterial hypertension. *Human Mutation*, 27(2), 121–132. <https://doi.org/10.1002/HUMU.20285>
- Maron, B. A., Brittan, E. L., Hess, E., Waldo, S. W., Barón, A. E., Huang, S., Goldstein, R. H., Assad, T., Wertheim, B. M., Alba, G. A., Leopold, J. A., Olschewski, H., Galiè, N., Simonneau, G., Kovacs, G., Tedford, R. J., Humbert, M., & Choudhary, G. (2020). Pulmonary vascular resistance and clinical outcomes in patients with pulmonary hypertension: a retrospective cohort study. *The Lancet. Respiratory Medicine*, 8(9), 873–884. [https://doi.org/10.1016/S2213-2600\(20\)30317-9](https://doi.org/10.1016/S2213-2600(20)30317-9)
- McLaughlin VV & Humbert M. (2015). Pulmonary Hypertension. In P. L. DL Mann, DP Zipes (Ed.), *Braundwalds Heart Disease, A Textbook of Cardiovascular Medicine Tenth Edition* (10th ed, pp. 1682–1702). Elsevier-Saunders.
- Menillo, A. M., Lee, L. S., & Pearson-Shaver, A. L. (2023). Atrial Septal Defect. *Cardiac Surgery: A Complete Guide*, 839–847. https://doi.org/10.1007/978-3-030-24174-2_92
- Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, Seventh Edition. 2003 by Saunders, an imprint of Elsevier, Inc. All rights reserved
- Mitchell, J. A., Ahmetaj-Shala, B., Kirkby, N. S., Wright, W. R., Mackenzie, L. S., Reed, D. M., & Mohamed, N. (2014). Role of prostacyclin in pulmonary hypertension. *Global Cardiology Science and Practice*, 2014(4), 53. <https://doi.org/10.5339/gcsp.2014.53>
- Montani, D., Lechartier, B., Girerd, B., Eyries, M., Ghigna, M. R., Savale, L., Jaïs, X., Seferian, A., Jevnikar, M., Boucly, A., Riou, M., Traclet, J., Chaouat, A., Levy, M., Pavé, J. Le, Fadel, E., Perros, F., Soubrier, F., Remy-Jardin, M., ... Humbert, M. (2022). An emerging phenotype of

- pulmonary arterial hypertension patients carrying SOX17 variants. *European Respiratory Journal*, 60(6). <https://doi.org/10.1183/13993003.00656-2022>
- Morrell, N. W., Adnot, S., Archer, S. L., Dupuis, J., Lloyd Jones, P., MacLean, M. R., McMurry, I. F., Stenmark, K. R., Thistlethwaite, P. A., Weissmann, N., Yuan, J. X. J., & Weir, E. K. (2009). Cellular and molecular basis of pulmonary arterial hypertension. *Journal of the American College of Cardiology*, 54(1 Suppl). <https://doi.org/10.1016/J.JACC.2009.04.018>
- Morrell, N. W., Aldred, M. A., Chung, W. K., Elliott, C. G., Nichols, W. C., Soubrier, F., Trembath, R. C., & Loyd, J. E. (2019). Genetics and genomics of pulmonary arterial hypertension. *European Respiratory Journal*, 53(1). <https://doi.org/10.1183/13993003.01899-2018>
- Nashat, H., Montanaro, C., Li, W., Kempny, A., Wort, S. J., Dimopoulos, K., Gatzoulis, M. A., & Babu-Narayan, S. V. (2018). Atrial septal defects and pulmonary arterial hypertension. *Journal of Thoracic Disease*, 10(Suppl 24), S2953. <https://doi.org/10.21037/JTD.2018.08.92>
- Nguyen, Q. L., Corey, C., White, P., Watson, A., Gladwin, M. T., Simon, M. A., & Shiva, S. (2017). Platelets from pulmonary hypertension patients show increased mitochondrial reserve capacity. *JCI Insight*, 2(5). <https://doi.org/10.1172/jci.insight.91415>
- Ntiloudi, D., Zanos, S., Gatzoulis, M. A., Karvounis, H., & Giannakoulias, G. (2019). How to evaluate patients with congenital heart disease-related pulmonary arterial hypertension. *Expert Review of Cardiovascular Therapy*, 17(1), 11–18. <https://doi.org/10.1080/14779072.2019.1550716>
- Opotowsky, A. R. (2015). Clinical evaluation and management of pulmonary hypertension in the adult with congenital heart disease. *Circulation*, 131(2), 200–210. <https://doi.org/10.1161/CIRCULATIONAHA.114.006976>
- Palmer, R. M. J., Ferrige, A. G., & Moncada, S. (1987). Nitric oxide release accounts for the biological activity of endothelium-derived relaxing factor. *Nature*, 327(6122), 524–526. <https://doi.org/10.1038/327524a0>
- Papamichalis, M., Xanthopoulos, A., Papamichalis, P., Skoularigis, J., & Triposkiadis, F. (2020). Adult congenital heart disease with pulmonary arterial hypertension: mechanisms and management. *Heart Failure Reviews*, 25(5), 773–794. <https://doi.org/10.1007/s10741-019-09847-5>
- Park, C. S., Kim, S. H., Yang, H. Y., Kim, J. H., Schermuly, R. T., Cho, Y. S., Kang, H., Park, J. H., Lee, E., Park, H. J., Yang, J. M., Noh, T. W., Lee, S. P., Bae, S. S., Han, J., Ju, Y. S., Park, J. B., & Kim, I. (2022). Sox17 Deficiency Promotes Pulmonary Arterial Hypertension via HGF/c-Met Signaling. *Circulation Research*, 131(10), 792–806. <https://doi.org/10.1161/CIRCRESAHA.122.320845>
- Pascall, E., & Tulloh, R. M. R. (2018). Pulmonary hypertension in congenital heart disease. *Future Cardiology*, 14(4), 369–375. <https://doi.org/10.2217/FCA-2017-0065>
- Paulus, W. J., Tschöpe, C., Sanderson, J. E., Rusconi, C., Flachskampf, F. A., Rademakers, F. E., Marino, P., Smiseth, O. A., De Keulenaer, G., Leite-Moreira, A. F., Borbély, A., Édes, I., Handoko, M. L., Heymans, S., Pezzali, N., Pieske, B., Dickstein, K., Fraser, A. G., & Brutsaert, D. L. (2007). How to diagnose diastolic heart failure: a consensus statement on the diagnosis of heart failure with normal left ventricular ejection fraction by the Heart Failure and Echocardiography Associations of the European Society of Cardiology. *European Heart Journal*, 28(20), 2539–2550. <https://doi.org/10.1093/EURHEARTJ/EHM037>
- Penny, D. J., & Vick, G. W. (2011). Ventricular septal defect. *Lancet (London, England)*, 377(9771), 1103–1112. [https://doi.org/10.1016/S0140-6736\(10\)61339-6](https://doi.org/10.1016/S0140-6736(10)61339-6)

- Pieske, B., Tschöpe, C., De Boer, R. A., Fraser, A. G., Anker, S. D., Donal, E., Edelmann, F., Fu, M., Guazzi, M., Lam, C. S. P., Lancellotti, P., Melenovsky, V., Morris, D. A., Nagel, E., Pieske-Kraigher, E., Ponikowski, P., Solomon, S. D., Vasan, R. S., Rutten, F. H., ... Filippatos, G. (2019). How to diagnose heart failure with preserved ejection fraction: the HFA-PEFF diagnostic algorithm: a consensus recommendation from the Heart Failure Association (HFA) of the European Society of Cardiology (ESC). *European Heart Journal*, 40(40), 3297–3317. <https://doi.org/10.1093/EURHEARTJ/EHZ641>
- Pietra, G. G., Capron, F., Stewart, S., Leone, O., Humbert, M., Robbins, I. M., Reid, L. M., & Tudor, R. M. (2004). Pathologic assessment of vasculopathies in pulmonary hypertension. *Journal of the American College of Cardiology*, 43(12 SUPPL.), S25–S32. <https://doi.org/10.1016/j.jacc.2004.02.033>
- Ploegstra, M. J., Ivy, D. D., Wheeler, J. G., Brand, M., Beghetti, M., Rosenzweig, E. B., Humpl, T., Iriart, X., Rouzic, E. M. Le, Bonnet, D., & Berger, R. M. F. (2016). Growth in children with pulmonary arterial hypertension: a longitudinal retrospective multiregistry study. *The Lancet. Respiratory Medicine*, 4(4), 281–290. [https://doi.org/10.1016/S2213-2600\(16\)00069-2](https://doi.org/10.1016/S2213-2600(16)00069-2)
- Post, M. C. (2013). Association between pulmonary hypertension and an atrial septal defect. *Netherlands Heart Journal*, 21(7–8), 331. <https://doi.org/10.1007/S12471-013-0432-9>
- Rich, S., Dantzker, D. R., Ayres, S. M., Bergofsky, E. H., Brundage, B. H., Detre, K. M., Fishman, A. P., Goldring, R. M., Groves, B. M., & Koerner, S. K. (1987). Primary pulmonary hypertension. A national prospective study. *Annals of Internal Medicine*, 107(2), 216–223. <https://doi.org/10.7326/0003-4819-107-2-216>
- Rychik, J., Jacobs, M. L., & Norwood, W. I. (1995). Acute changes in left ventricular geometry after volume reduction operation. *The Annals of Thoracic Surgery*, 60(5), 1267–1274. [https://doi.org/10.1016/0003-4975\(95\)00704-O](https://doi.org/10.1016/0003-4975(95)00704-O)
- Saadah, Z. (2013). Perbedaan Pertumbuhan Anak Penderita Penyakit Jantung Bawaan Sianotik Dan Asianotik. *Jurnal Media Medika Muda*, 1–10.
- Sánchez-Duffhues, G., Hiepen, C., Knaus, P., & ten Dijke, P. (2015). Bone morphogenetic protein signaling in bone homeostasis. *Bone*, 80, 43–59. <https://doi.org/10.1016/J.BONE.2015.05.025>
- Sangam, S., Sun, X., Schwantes-An, T. H., Yegambaram, M., Lu, Q., Shi, Y., Cook, T., Fisher, A., Frump, A. L., Coleman, A., Sun, Y., Liang, S., Crawford, H., Lutz, K. A., Maun, A. D., Pauciulo, M. W., Karnes, J. H., Chaudhary, K. R., Stewart, D. J., ... Desai, A. A. (2023). SOX17 Deficiency Mediates Pulmonary Hypertension: At the Crossroads of Sex, Metabolism, and Genetics. *American Journal of Respiratory and Critical Care Medicine*, 207(8), 1055–1069. <https://doi.org/10.1164/RCCM.202203-0450OC>
- Shao, Z., Wang, Z., Shrestha, K., Thakur, A., Borowski, A. G., Sweet, W., Thomas, J. D., Moravec, C. S., Hazen, S. L., & Tang, W. H. W. (2012). Pulmonary hypertension associated with advanced systolic heart failure: dysregulated arginine metabolism and importance of compensatory dimethylarginine dimethylaminohydrolase-1. *Journal of the American College of Cardiology*, 59(13), 1150–1158. <https://doi.org/10.1016/j.jacc.2011.12.022>
- Song, J., Hinderhofer, K., Kaufmann, L. T., Benjamin, N., Fischer, C., Grünig, E., & Eichstaedt, C. A. (2020). BMPR2 Promoter Variants Effect Gene Expression in Pulmonary Arterial Hypertension Patients. *Genes*, 11(10), 1–12. <https://doi.org/10.3390/GENES1110116>
- Surmeli-Onay, O., Cindik, N., Kinik, S. T., Ozkan, S., Bayraktar, N., & Tokel, K. (2011). The effect of corrective surgery on serum IGF-1, IGFBP-3 levels and growth in children with congenital

- heart disease. *Journal of Pediatric Endocrinology and Metabolism*, 24(7–8), 483–487. <https://doi.org/10.1515/JPEM.2011.061/MACHINEREADABLECITATION/RIS>
- Sysol, J. R., & Machado, R. F. (2018). Classification and pathophysiology of pulmonary hypertension. *Continuing Cardiology Education*, 4(1), 2–12. <https://doi.org/10.1002/cce2.71>
- Takahama, H., McCully, R. B., Frantz, R. P., & Kane, G. C. (2017). Unraveling the RV Ejection Doppler Envelope: Insight Into Pulmonary Artery Hemodynamics and Disease Severity. *JACC. Cardiovascular Imaging*, 10(10 Pt B), 1268–1277. <https://doi.org/10.1016/J.JCMG.2016.12.021>
- Tatius, B., Wasityastuti, W., Astarini, F. D., & Nugrahaningsih, D. A. A. (2021). Significance of BMPR2 mutations in pulmonary arterial hypertension. *Respiratory Investigation*, 59(4), 397–407. <https://doi.org/10.1016/J.RESINV.2021.03.011>
- Thenappan, T., Ormiston, M. L., Ryan, J. J., & Archer, S. L. (2018). Pulmonary arterial hypertension: pathogenesis and clinical management. *BMJ (Clinical Research Ed.)*, 360. <https://doi.org/10.1136/BMJ.J5492>
- Theobald, V., Benjamin, N., Seyfarth, H. J., Halank, M., Schneider, M. A., Richtmann, S., Hinderhofer, K., Xanthouli, P., Egenlauf, B., Seeger, R., Hoeper, M. M., Jonigk, D., Grünig, E., & Eichstaedt, C. A. (2022). Reduction of BMPR2 mRNA Expression in Peripheral Blood of Pulmonary Arterial Hypertension Patients: A Marker for Disease Severity? *Genes*, 13(5). <https://doi.org/10.3390/GENES13050759>
- Tjan, W., Purwandini, D., & Purnamasari, C. B. (2020). Pulmonary Hypertension in Patient with Acyanotic Congenital Heart Defects in Abdul Wahab Sjahranie General Hospital, Samarinda from 2015-2016. *Cardiovascular and Cardiometabolic Journal (CCJ)*, 1(2), 45–49. <https://doi.org/10.20473/CCJ.V1I2.2020.45-49>
- Tsai, K.L., Al’Aref, S.J., Van Rosendael, A.R. & Bax, J.J. (2018) Complex congenital heart disease. 3D Printing Applications in Cardiovascular Medicine. 79–101. doi:10.1016/B978-0-12-803917-5.00005-5.
- Tueller, C., Stricker, H., Soccal, P., Tamm, M., Aubert, J. D., Maggiorini, M., Zwahlen, M., & Nicod, L. (2008). Epidemiology of pulmonary hypertension: New data from the swiss registry. *Swiss Medical Weekly*. <https://doi.org/10.7892/boris.27895>
- Ujunwa, F.A., Ujuanbi, I.S. & Chinawa, J.M. (2021) Complex congenital heart diseases among children presenting for cardiac surgery in a tertiary health facility in Enugu; South-East Nigeria. A rising trend. *Nigerian journal of clinical practice*. 24 (1), 100–103. doi:10.4103/njcp.njcp_134_20.
- Varan, B., Tokel, K., & Yilmaz, G. (1999). Malnutrition and growth failure in cyanotic and acyanotic congenital heart disease with and without pulmonary hypertension. *Archives of Disease in Childhood*, 81(1), 49–52. <https://doi.org/10.1136/ADC.81.1.49>
- Vongpatanasin, W., Brickner, M. E., Hillis, L. D., & Lange, R. A. (1998). The Eisenmenger Syndrome in Adults. *Annals of Internal Medicine*, 128(9), 745–755. <https://doi.org/10.7326/0003-4819-128-9-19980510-00008>
- Wang, K., & Zeng, R. (2023). Cyanosis. *Handbook of Clinical Diagnostics*, 39–40. https://doi.org/10.1007/978-981-13-7677-1_12
- Wang, L., Moonen, J. R., Cao, A., Isobe, S., Li, C. G., Tojais, N. F., Taylor, S., Marciano, D. P., Chen, P. I., Gu, M., Li, D., Harper, R. L., El-Bizri, N., Kim, Y. M., Stankunas, K., & Rabinovitch, M. (2023). Dysregulated Smooth Muscle Cell BMPR2–ARRB2 Axis Causes

- Pulmonary Hypertension. *Circulation Research*, 132(5), 545–564.
<https://doi.org/10.1161/CIRCRESAHA.121.320541>
- Warnes, C. A. (2008). *Sex Differences in Congenital Heart Disease Should a Woman Be More Like a Man? Editorial.* <https://doi.org/10.1161/CIRCULATIONAHA.108.785899>
- Welch, C. L., Austin, E. D., & Chung, W. K. (2021). Genes that drive the pathobiology of pediatric pulmonary arterial hypertension. *Pediatric Pulmonology*, 56(3), 614–620.
<https://doi.org/10.1002/PPUL.24637>
- Welch, C. L., & Chung, W. K. (2020). Genetics and Other Omics in Pediatric Pulmonary Arterial Hypertension. *Chest*, 157(5), 1287–1295. <https://doi.org/10.1016/J.CHEST.2020.01.013>
- Wu, Y., Wharton, J., Walters, R., Vasilaki, E., Aman, J., Zhao, L., Wilkins, M. R., & Rhodes, C. J. (2021). The pathophysiological role of novel pulmonary arterial hypertension gene SOX17. *The European Respiratory Journal*, 58(3). <https://doi.org/10.1183/13993003.04172-2020>
- Xanthouli, P., Jordan, S., Milde, N., Marra, A., Blank, N., Egenlauf, B., Gorenflo, M., Harutyunova, S., Lorenz, H. M., Nagel, C., Theobald, V., Lichtblau, M., Berlier, C., Ulrich, S., Grünig, E., Benjamin, N., & Distler, O. (2020). Haemodynamic phenotypes and survival in patients with systemic sclerosis: the impact of the new definition of pulmonary arterial hypertension. *Ann Rheum Dis*, 79(3), 370–378. <https://doi.org/10.1136/ANNRHEUMDIS-2019-216476>
- Xue, L., Yang, Y., Sun, B., Liu, B., Zeng, Q., & Xiong, C. (2021). Mildly elevated pulmonary arterial pressure is associated with a high risk of progression to pulmonary hypertension and increased mortality: A systematic review and meta-analysis. *Journal of the American Heart Association*, 10(7), 18374. <https://doi.org/10.1161/JAHA.120.018374>
- Yang, J., Davies, R. J., Southwood, M., Long, L., Yang, X., Sobolewski, A., Upton, P. D., Trembath, R. C., & Morrell, N. W. (2008). Mutations in bone morphogenetic protein type II receptor cause dysregulation of id gene expression in pulmonary artery smooth muscle cells implications for familial pulmonary arterial hypertension. *Circulation Research*, 102(10), 1212–1221.
<https://doi.org/10.1161/CIRCRESAHA.108.173567>
- Yang, J., Li, X., Al-Lamki, R. S., Wu, C., Weiss, A., Berk, J., Schermuly, R. T., & Morrell, N. W. (2013). Sildenafil potentiates bone morphogenetic protein signaling in pulmonary arterial smooth muscle cells and in experimental pulmonary hypertension. *Arteriosclerosis, Thrombosis, and Vascular Biology*, 33(1), 34–42. <https://doi.org/10.1161/ATVBAHA.112.300121>
- Yuan Y. Vascularized Lung Tissue Engineering. Encyclopedia of Tissue Engineering and Regenerative Medicine. 2019;179–87.
- Zhang, Y., Peng, B., & Han, Y. (2018). MiR-23a regulates the proliferation and migration of human pulmonary artery smooth muscle cells (HPASMCs) through targeting BMPR2/Smad1 signaling. *Biomedicine & Pharmacotherapy = Biomedecine & Pharmacotherapie*, 103, 1279–1286.
<https://doi.org/10.1016/J.BIOPHA.2018.04.172>
- Zheng, Q., Zhao, Z., Zuo, J., Yang, J., Wang, H., Yu, S., & Yi, D. (2009). A comparative study: Early results and complications of percutaneous and surgical closure of ventricular septal defect. *Cardiology*, 114(4), 238–243. <https://doi.org/10.1159/000232405>
- Zhu, N., Welch, C. L., Wang, J., Allen, P. M., Gonzaga-Jauregui, C., Ma, L., King, A. K., Krishnan, U., Rosenzweig, E. B., Ivy, D. D., Austin, E. D., Hamid, R., Pauciulo, M. W., Lutz, K. A., Nichols, W. C., Reid, J. G., Overton, J. D., Baras, A., Dewey, F. E., ... Chung, W. K. (2018). Rare variants in SOX17 are associated with pulmonary arterial hypertension with congenital heart disease. *Genome Medicine*, 10(1). <https://doi.org/10.1186/S13073-018-0566-X>

Zou, X., Liu, T., Huang, Z., Zhou, W., Yuan, M., Zhao, H., Pan, Z., Chen, P., Shao, Y., Hu, X.,
Zhang, S., Zheng, S., Zhang, Y., & Huang, P. (2023). SOX17 is a Critical Factor in Maintaining
Endothelial Function in Pulmonary Hypertension by an Exosome-Mediated Autocrine Manner.
Advanced Science (Weinheim, Baden-Wurttemberg, Germany), 10(14).
<https://doi.org/10.1002/ADVS.202206139>

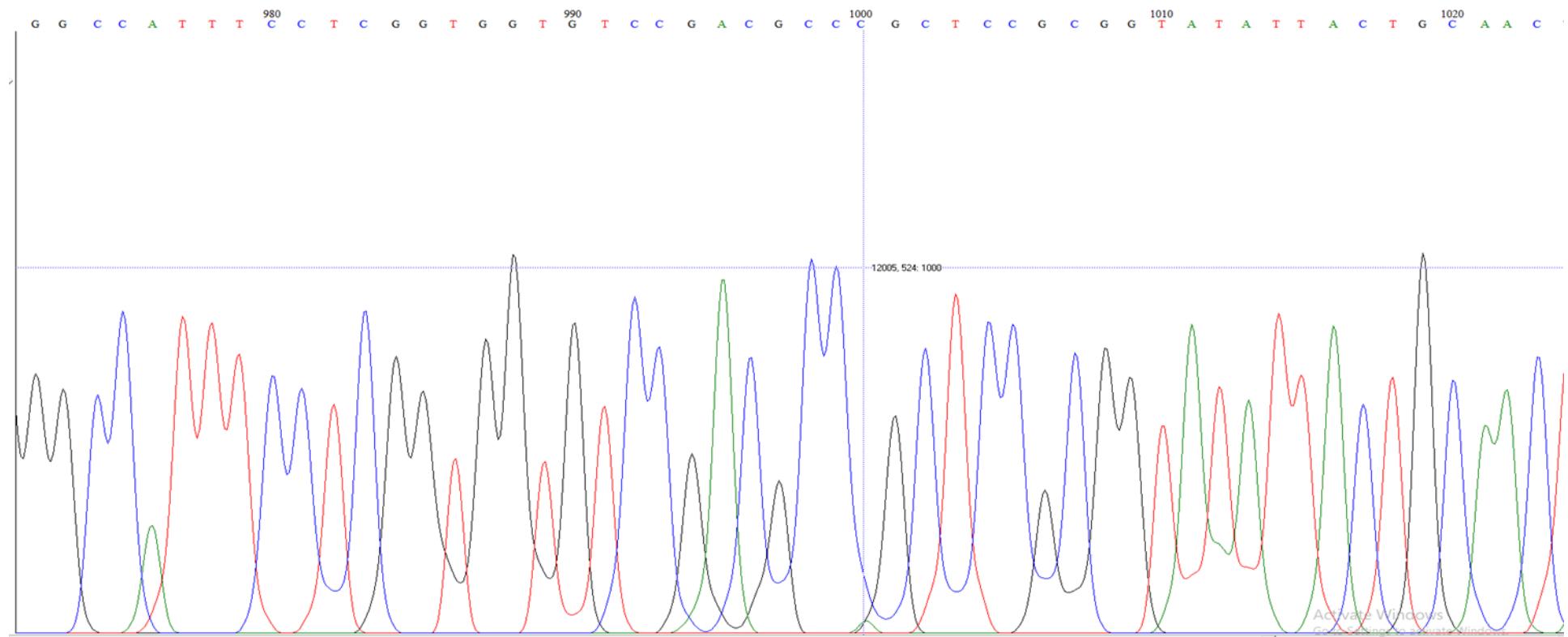
APPENDIX
Variasi Allel Gen SOX17

SAMPEL	Hasil PCR Gen GCLC	Hasil Sequencing	Genotype	Perubahan AA
SAMPEL 1	1200 bp	Mutasi (A988C)	AC	S329A
SAMPEL 2	1200 bp	WT		
SAMPEL 3	1200 bp	WT		
SAMPEL 4	1200 bp	WT		
SAMPEL 5	1200 bp	WT		
SAMPEL 6	1200 bp	WT		
SAMPEL 7	1200 bp	WT		
SAMPEL 8	1200 bp	WT		
SAMPEL 9	1200 bp	WT		
SAMPEL 10	1200 bp	WT		
SAMPEL 11	1200 bp	Mutasi (G1047C)	GC	Q349H
SAMPEL 12	1200 bp	WT		
SAMPEL 13	1200 bp	WT		
SAMPEL 14	1200 bp	WT		
SAMPEL 15	1200 bp	Mutasi (850_851insA)		
SAMPEL 16	1200 bp	WT		
SAMPEL 17	1200 bp	WT		
SAMPEL 18	1200 bp	Mutasi (G1047C)	GC	Q349H
SAMPEL 19	1200 bp	Mutasi (G1047C)	GC	Q349H
SAMPEL 20	1200 bp	Mutasi (850_851insA)		
SAMPEL 21	1200 bp	WT		
SAMPEL 22	1200 bp	Mutasi (G1047C)	GC	Q349H
SAMPEL 23	1200 bp	WT		
SAMPEL 24	1200 bp	WT		
SAMPEL 25	1200 bp	WT		
SAMPEL 26	1200 bp	WT		
SAMPEL 27	1200 bp	WT		
SAMPEL 28	1200 bp	Mutasi (850_851insA)		
SAMPEL 29	1200 bp	Mutasi (850_851insA; A988C)	AC	S329A
SAMPEL 30	1200 bp	WT		
SAMPEL 31	1200 bp	Mutasi (A988C)	AC	S329A
SAMPEL 32	1200 bp	WT		
SAMPEL 33	1200 bp	WT		
SAMPEL 34	1200 bp	WT		
SAMPEL 35	1200 bp	Mutasi (A988C)	AC	S329A
SAMPEL 36	1200 bp	WT		
SAMPEL 37	1200 bp	WT		
SAMPEL 38	1200 bp	Mutasi (G1047C)	GC	Q349H
SAMPEL 39	1200 bp	Mutasi (850_851insA)		
SAMPEL 40	1200 bp	WT		

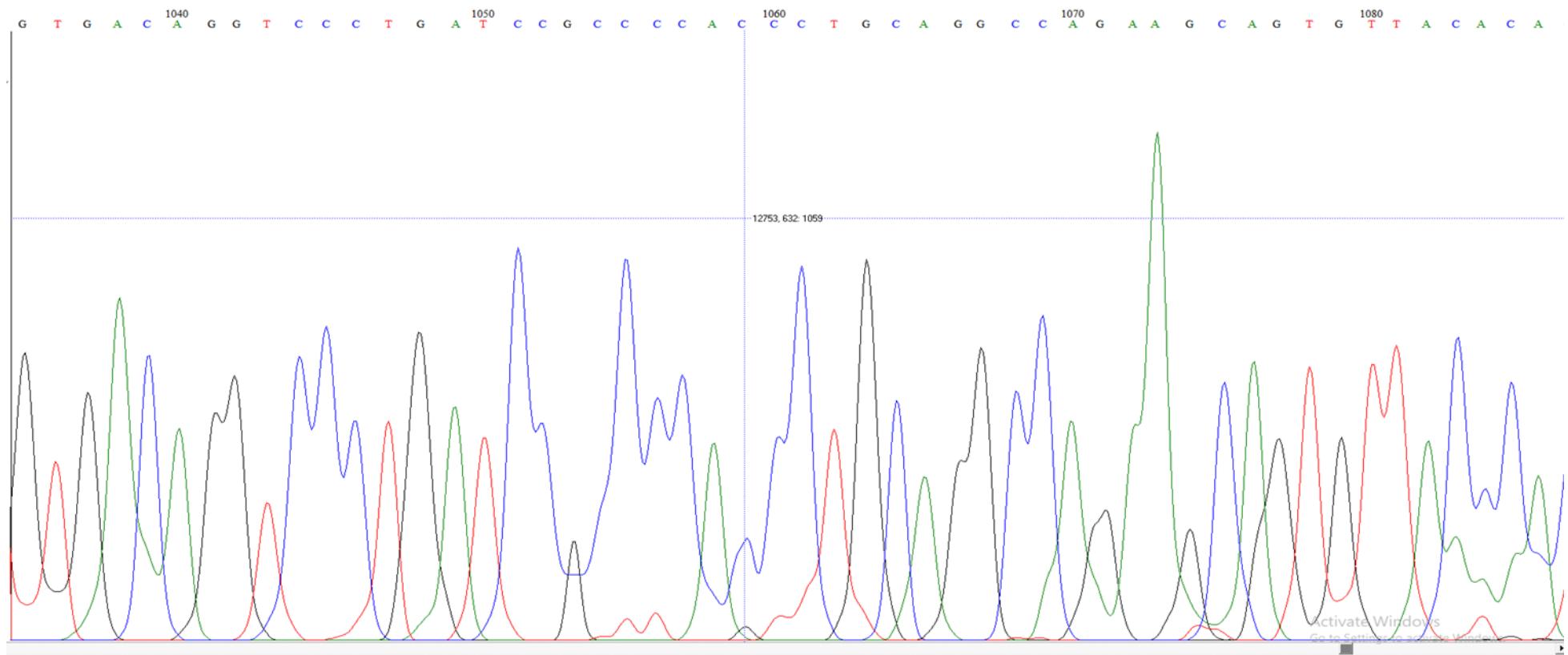
SAMPEL 41	1200 bp	WT		
SAMPEL 42	1200 bp	WT		
SAMPEL 43	1200 bp	Mutasi (850_851insA)		
SAMPEL 44	1200 bp	WT		
SAMPEL 45	1200 bp	Mutasi (850_851insA)		
SAMPEL 46	1200 bp	Mutasi (G1047C)	GC	Q349H
SAMPEL 47	1200 bp	WT		
SAMPEL 48	1200 bp	WT		
SAMPEL 49	1200 bp	Mutasi (850_851insA)		
SAMPEL 50	1200 bp	WT		
SAMPEL 51	1200 bp	Mutasi (A988C)	AC	S329A
SAMPEL 52	1200 bp	WT		
SAMPEL 53	1200 bp	WT		
SAMPEL 54	1200 bp	WT		
SAMPEL 55	1200 bp	WT		
SAMPEL 56	1200 bp	WT		
SAMPEL 57	1200 bp	WT		
SAMPEL 58	1200 bp	WT		
SAMPEL 59	1200 bp	WT		
SAMPEL 60	1200 bp	WT		
SAMPEL 61	1200 bp	WT		
SAMPEL 62	1200 bp	Mutasi (850_851insA)		
SAMPEL 63	1200 bp	Mutasi (850_851insA)		
SAMPEL 64	1200 bp	WT		
SAMPEL 65	1200 bp	WT		
SAMPEL 66	1200 bp	Mutasi (850_851insA; G1047C)	GC	Q39H
SAMPEL 67	1200 bp	WT		
SAMPEL 68	1200 bp	WT		
SAMPEL 69	1200 bp	WT		
SAMPEL 70	1200 bp	WT		
SAMPEL 71	1200 bp	Mutasi (850_851insA)		
SAMPEL 72	1200 bp	WT		
SAMPEL 73	1200 bp	WT		
SAMPEL 74	1200 bp	WT		
SAMPEL 75	1200 bp	WT		
SAMPEL 76	1200 bp	WT		
SAMPEL 77	1200 bp	WT		
SAMPEL 78	1200 bp	WT		
SAMPEL 79	1200 bp	WT		
SAMPEL 80	1200 bp	WT		
SAMPEL 81	1200 bp	WT		
SAMPEL 82	1200 bp	WT		
SAMPEL 83	1200 bp	WT		
SAMPEL 84	1200 bp	WT		

SAMPEL 85	1200 bp	Mutasi (850_851insA; A988C)	AC	S329A
SAMPEL 86	1200 bp	WT		
SAMPEL 87	1200 bp	Mutasi (850_851insA)		
SAMPEL 88	1200 bp	WT		
SAMPEL 89	1200 bp	Mutasi (850_851insA)		
SAMPEL 90	1200 bp	WT		
SAMPEL 91	1200 bp	Mutasi (850_851insA)		
SAMPEL 92	1200 bp	Mutasi (850_851insA)		
SAMPEL 93	1200 bp	WT		
SAMPEL 94	1200 bp	WT		
SAMPEL 95	1200 bp	WT		
SAMPEL 96	1200 bp	WT		
SAMPEL 97	1200 bp	WT		
SAMPEL 98	1200 bp	WT		
SAMPEL 99	1200 bp	WT		
SAMPEL 100	1200 bp	WT		

Mutasi Gen SOX17 (A988C)



Mutasi Gen SOX17 (G1047C)



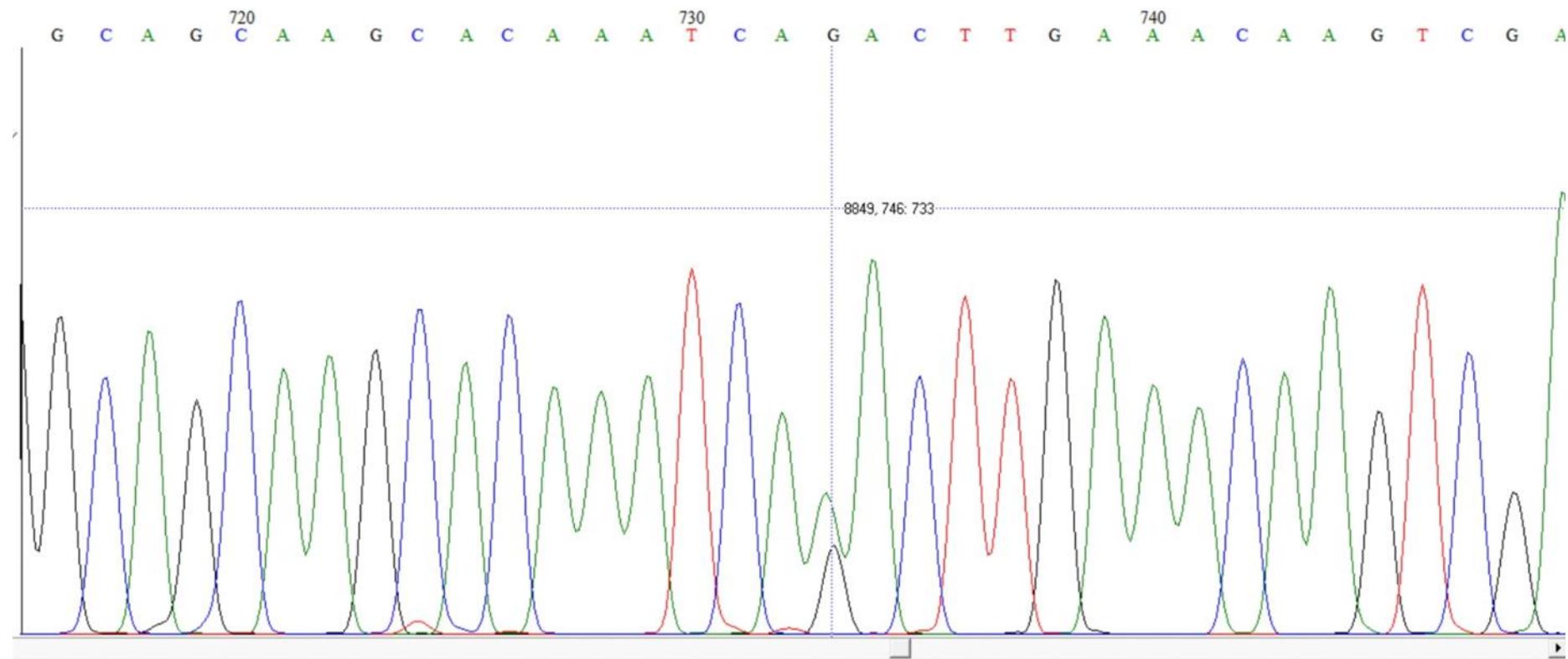
Variasi Allel Gen BMPR2

No.	SAMPEL	Hasil PCR Gen GCLC	Hasil Sequencing	Genotype	Perubahan AA
1	SAMPEL 1	1200 bp	Mutasi (2347 A>G)	AG	N783D
2	SAMPEL 2	1200 bp	WT		
3	SAMPEL 3	1200 bp	WT		
4	SAMPEL 4	1200 bp	WT		
5	SAMPEL 5	1200 bp	WT		
6	SAMPEL 6	1200 bp	WT		
7	SAMPEL 7	1200 bp	WT		
8	SAMPEL 8	1200 bp	WT		
9	SAMPEL 9	1200 bp	WT		
10	SAMPEL 10	1200 bp	Mutasi (2668 A>C)	AC	K890R
11	SAMPEL 11	1200 bp	WT		
12	SAMPEL 12	1200 bp	WT		
13	SAMPEL 13	1200 bp	WT		
14	SAMPEL 14	1200 bp	WT		
15	SAMPEL 15	1200 bp	Mutasi	c.2668delA	
16	SAMPEL 16	1200 bp	WT		
17	SAMPEL 17	1200 bp	WT		
18	SAMPEL 18	1200 bp	WT		
19	SAMPEL 19	1200 bp	WT		
20	SAMPEL 20	1200 bp	WT		
21	SAMPEL 21	1200 bp	WT		
22	SAMPEL 22	1200 bp	WT		
23	SAMPEL 23	1200 bp	WT		
24	SAMPEL 24	1200 bp	WT		
25	SAMPEL 25	1200 bp	WT		
26	SAMPEL 26	1200 bp	WT		
27	SAMPEL 27	1200 bp	WT		
28	SAMPEL 28	1200 bp	WT		
29	SAMPEL 29	1200 bp	WT		
30	SAMPEL 30	1200 bp	WT		
31	SAMPEL 31	1200 bp	WT		
32	SAMPEL 32	1200 bp	Mutasi (2668 A>C)	AC	K890R
33	SAMPEL 33	1200 bp	WT		
34	SAMPEL 34	1200 bp	Mutasi (2668 A>C)	AC	K890R
35	SAMPEL 35	1200 bp	WT		
36	SAMPEL 36	1200 bp	WT		
37	SAMPEL 37	1200 bp	Mutasi (2668 A>C)	AC	K890R
38	SAMPEL 38	1200 bp	Mutasi (2668 A>C)	AC	K890R
39	SAMPEL 39	1200 bp	Mutasi	c.2626delC; c.2661delT	
40	SAMPEL 40	1200 bp	WT		
41	SAMPEL 41	1200 bp	WT		
42	SAMPEL 42	1200 bp	WT		

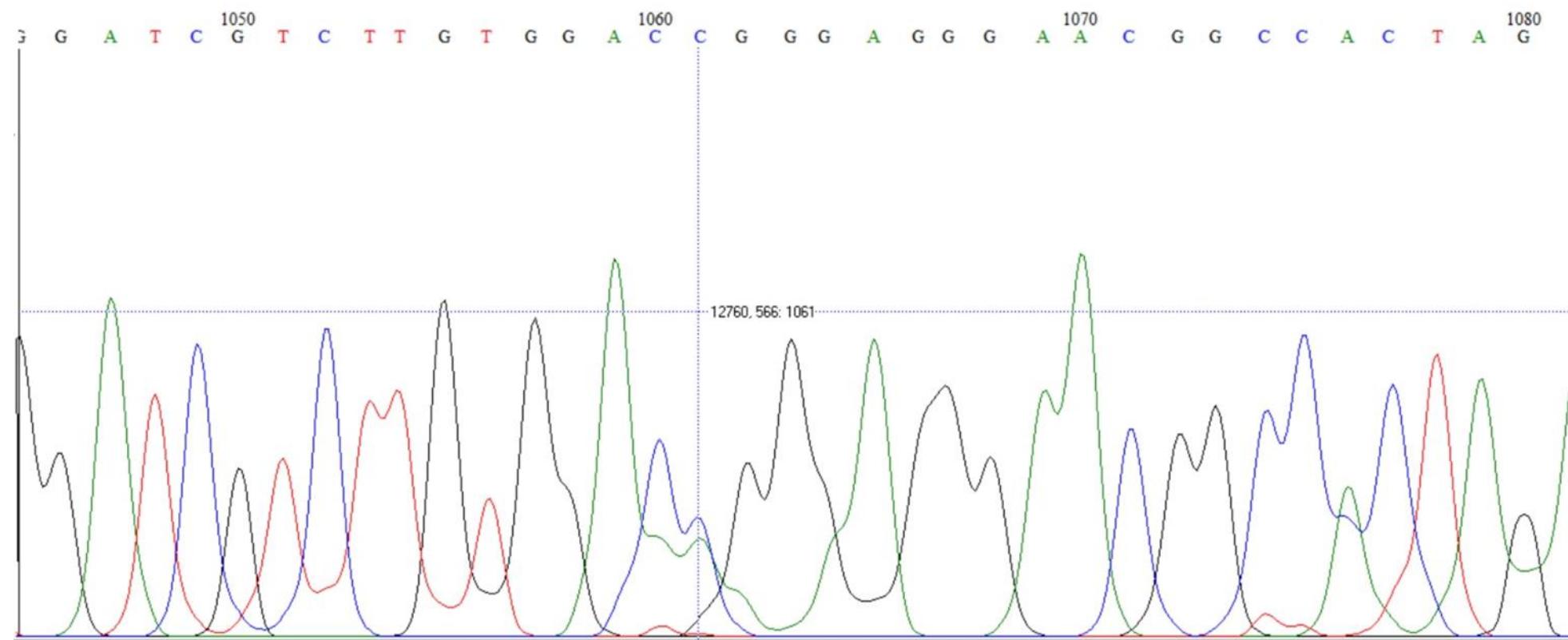
43	SAMPEL 43	1200 bp	WT		
44	SAMPEL 44	1200 bp	Mutasi	c.2668delA	
45	SAMPEL 45	1200 bp	WT		
46	SAMPEL 46	1200 bp	Mutasi (2668 A>C)	AC	K890R
47	SAMPEL 47	1200 bp	WT		
48	SAMPEL 48	1200 bp	Mutasi	c.2668delA	
49	SAMPEL 49	1200 bp	WT		
50	SAMPEL 50	1200 bp	WT		
51	SAMPEL 51	1200 bp	WT		
52	SAMPEL 52	1200 bp	Mutasi (2650 C>T)	CT	L884L
53	SAMPEL 53	1200 bp	WT		
54	SAMPEL 54	1200 bp	WT		
55	SAMPEL 55	1200 bp	WT		
56	SAMPEL 56	1200 bp	WT		
57	SAMPEL 57	1200 bp	WT		
58	SAMPEL 58	1200 bp	WT		
59	SAMPEL 59	1200 bp	Mutasi	c.2668delA	
60	SAMPEL 60	1200 bp	Mutasi	c.2668delA	
61	SAMPEL 61	1200 bp	WT		
62	SAMPEL 62	1200 bp	WT		
63	SAMPEL 63	1200 bp	WT		
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66	SAMPEL 66	1200 bp	WT		
67	SAMPEL 67	1200 bp	WT		
68	SAMPEL 68	1200 bp	WT		
69	SAMPEL 69	1200 bp	WT		
70	SAMPEL 70	1200 bp	WT		
71	SAMPEL 71	1200 bp	WT		
72	SAMPEL 72	1200 bp	WT		
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74	SAMPEL 74	1200 bp	WT		
75	SAMPEL 75	1200 bp	WT		
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88	SAMPEL 88	1200 bp	WT		
89	SAMPEL 89	1200 bp	WT		

90	SAMPEL 90	1200 bp	WT		
91	SAMPEL 91	1200 bp	WT		
92	SAMPEL 92	1200 bp	WT		
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100	SAMPEL 100	1200 bp	WT		

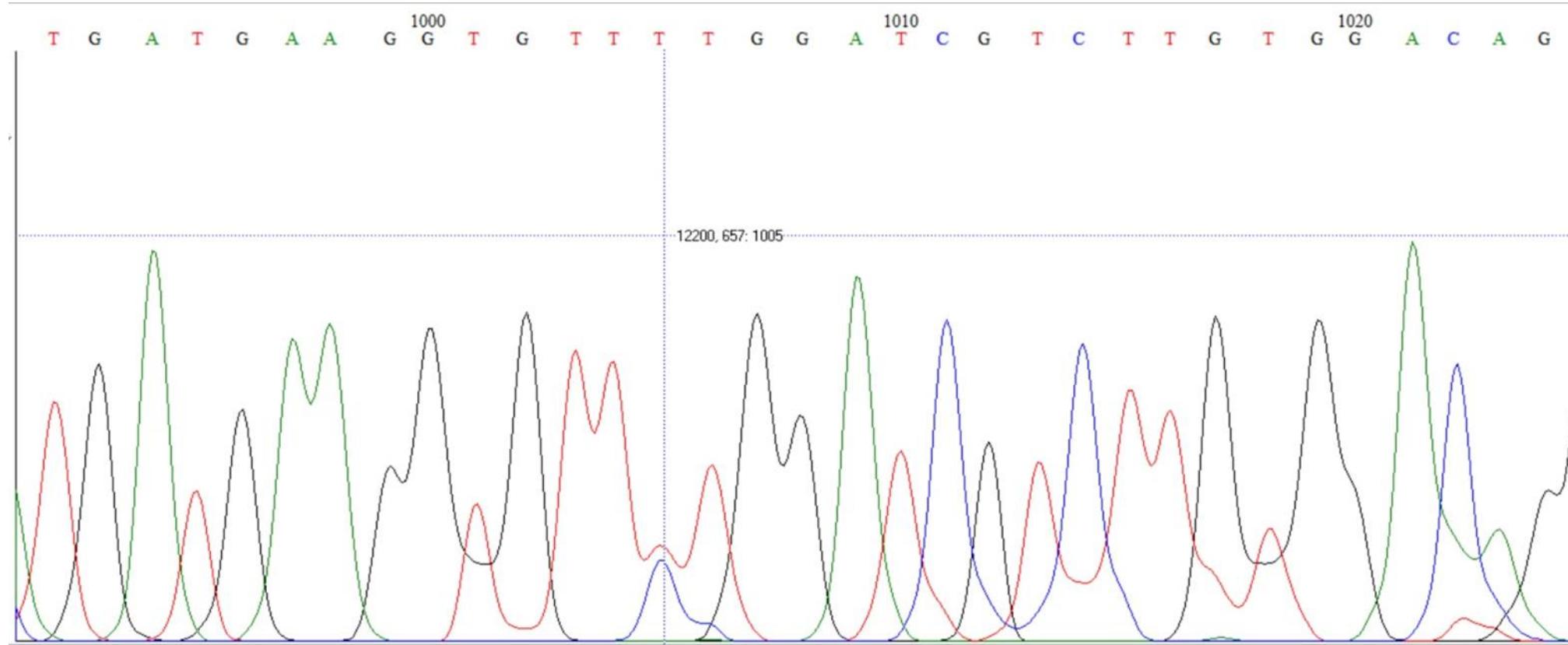
Mutasi Gen BMPR2 2347 A>G



Mutasi Gen BMPR2 2668 A>C



Mutasi Gen BMPR2 2650 C>T



Gene Expression: BMPR2

Target	Sample Biological Group	Control	Expression	Expression SEM	Corrected Expression SEM	Mean Cq	Cq SEM	P-Value
ACTIN	1_PH				23,83	0,00000		
ACTIN	10_PH				33,29	0,00000		
ACTIN	101_NON PH				36,39	0,00000		
ACTIN	11_PH				28,11	0,00000		
ACTIN	12_NON PH				23,57	0,00000		
ACTIN	13_PH				29,09	0,00000		
ACTIN	14_NON PH				26,29	0,00000		
ACTIN	15_PH				27,59	0,00000		
ACTIN	16_NON PH				24,35	0,00000		
ACTIN	17_NON PH				30,47	0,00000		
ACTIN	18_NON PH				26,93	0,00000		
ACTIN	19_NON PH				20,86	0,00000		
ACTIN	2_NON PH				22,15	0,00000		
ACTIN	20_PH				23,79	0,00000		
ACTIN	21_PH				22,44	0,00000		
ACTIN	26_NON PH				25,35	0,00000		
ACTIN	27_PH				21,51	0,00000		
ACTIN	28_PH				28,65	0,00000		
ACTIN	29_NON PH				27,28	0,00000		
ACTIN	3_PH				20,21	0,00000		
ACTIN	30_NON PH				32,14	0,00000		
ACTIN	31_PH				30,81	0,00000		
ACTIN	32_PH				30,60	0,00000		
ACTIN	33_PH				28,39	0,00000		
ACTIN	34_NON PH				30,07	0,00000		
ACTIN	35_PH				32,12	0,00000		
ACTIN	36_PH				31,83	0,00000		
ACTIN	37_PH				27,74	0,00000		
ACTIN	38_PH				27,21	0,00000		
ACTIN	39_PH				22,11	0,00000		
ACTIN	4_NON PH				23,27	0,00000		
ACTIN	40_NON PH				25,69	0,00000		
ACTIN	41_PH				22,30	0,00000		
ACTIN	42_PH				25,98	0,00000		
ACTIN	43_NON PH				25,02	0,00000		
ACTIN	44_NON PH				21,60	0,00000		
ACTIN	45_PH				23,76	0,00000		
ACTIN	46_NON PH				24,42	0,00000		
ACTIN	47_PH				23,49	0,00000		
ACTIN	48_PH				23,22	0,00000		

ACTIN	49_PH					21,79	0,00000	
ACTIN	5_PH					22,77	0,00000	
ACTIN	50_NON PH					23,12	0,00000	
ACTIN	51_NON PH					21,81	0,00000	
ACTIN	52_NON PH					22,52	0,00000	
ACTIN	53_NON PH					23,50	0,00000	
ACTIN	54_PH					27,75	0,00000	
ACTIN	55_NON PH					35,02	0,00000	
ACTIN	56_NON PH					21,28	0,00000	
ACTIN	58_NON PH					22,71	0,00000	
ACTIN	60_NON PH					30,20	0,00000	
ACTIN	61_PH					23,13	0,00000	
ACTIN	63_PH					28,16	0,00000	
ACTIN	64_NON PH					32,80	0,00000	
ACTIN	65_PH					31,90	0,00000	
ACTIN	67_PH					31,38	0,00000	
ACTIN	68_NON PH					30,01	0,00000	
ACTIN	69_NON PH					30,90	0,00000	
ACTIN	7_NON PH					22,20	0,00000	
ACTIN	70_NON PH					35,59	0,00000	
ACTIN	71_NON PH					29,19	0,00000	
ACTIN	72_PH					29,43	0,00000	
ACTIN	73_PH					24,56	0,00000	
ACTIN	74_NON PH					29,83	0,00000	
ACTIN	75_PH					24,27	0,00000	
ACTIN	76_PH					37,11	0,00000	
ACTIN	77_NON PH					27,24	0,00000	
ACTIN	78_NON PH					38,19	0,00000	
ACTIN	79_PH					29,44	0,00000	
ACTIN	8_PH					20,49	0,00000	
ACTIN	80_PH					27,44	0,00000	
ACTIN	81_PH					27,86	0,00000	
ACTIN	82_NON PH					22,73	0,00000	
ACTIN	83_PH					19,79	0,00000	
ACTIN	84_PH					21,18	0,00000	
ACTIN	85_PH					23,28	0,00000	
ACTIN	86_PH					38,40	0,00000	
ACTIN	87_PH					34,15	0,00000	
ACTIN	88_NON PH					35,69	0,00000	
ACTIN	89_PH					31,99	0,00000	
ACTIN	9_PH					21,44	0,00000	
ACTIN	92_NON PH					36,33	0,00000	
ACTIN	93_PH					30,86	0,00000	
ACTIN	94_NON PH					30,36	0,00000	

ACTIN	95_PH					31,44	0,00000	
ACTIN	96_PH					32,29	0,00000	
ACTIN	97_PH					36,63	0,00000	
ACTIN	98_NON PH					31,14	0,00000	
ACTIN	99_NON PH					37,75	0,00000	
ACTIN	S1_SEHAT					33,60	0,00000	
ACTIN	S10_SEHAT					31,59	0,00000	
ACTIN	S2_SEHAT					34,46	0,00000	
ACTIN	S3_SEHAT					32,15	0,00000	
ACTIN	S4_SEHAT					34,74	0,00000	
ACTIN	S5_SEHAT					29,80	0,00000	
ACTIN	S6_SEHAT					28,53	0,00000	
ACTIN	S7_SEHAT					29,75	0,00000	
ACTIN	S8_SEHAT					30,42	0,00000	
ACTIN	S9_SEHAT					28,39	0,00000	
BMPR2	1_PH		0,59272	0,00000	0,00000	29,53	0,00000	
BMPR2	10_PH		7,17098	0,00000	0,00000	35,39	0,00000	
BMPR2	100_NON PH					35,55	0,00000	
BMPR2	11_PH		5,00018	0,00000	0,00000	30,74	0,00000	
BMPR2	12_NON PH		0,32787	0,00000	0,00000	30,13	0,00000	
BMPR2	13_PH		0,46807	0,00000	0,00000	35,13	0,00000	
BMPR2	14_NON PH		0,57385	0,00000	0,00000	32,04	0,00000	
BMPR2	15_PH		0,69296	0,00000	0,00000	33,07	0,00000	
BMPR2	16_NON PH		0,48308	0,00000	0,00000	30,35	0,00000	
BMPR2	17_NON PH		20,50166	0,00000	0,00000	31,06	0,00000	
BMPR2	18_NON PH		0,49810	0,00000	0,00000	32,89	0,00000	
BMPR2	19_NON PH		0,32521	0,00000	0,00000	27,43	0,00000	
BMPR2	2_NON PH		0,23672	0,00000	0,00000	29,17	0,00000	
BMPR2	20_PH		0,05390	0,00000	0,00000	32,95	0,00000	
BMPR2	21_PH		0,90407	0,00000	0,00000	27,53	0,00000	
BMPR2	26_NON PH		0,90823	0,00000	0,00000	30,44	0,00000	
BMPR2	27_PH		0,50068	0,00000	0,00000	27,46	0,00000	
BMPR2	28_PH		0,15621	0,00000	0,00000	36,27	0,00000	
BMPR2	29_NON PH		0,79321	0,00000	0,00000	32,56	0,00000	
BMPR2	3_PH		0,64979	0,00000	0,00000	25,77	0,00000	
BMPR2	30_NON PH		3,35774	0,00000	0,00000	35,34	0,00000	
BMPR2	31_PH		0,59553	0,00000	0,00000	36,50	0,00000	
BMPR2	32_PH		0,29198	0,00000	0,00000	37,32	0,00000	
BMPR2	33_PH		0,65883	0,00000	0,00000	33,94	0,00000	
BMPR2	34_NON PH		0,95504	0,00000	0,00000	35,08	0,00000	
BMPR2	35_PH		1,98773	0,00000	0,00000	36,08	0,00000	
BMPR2	37_PH		0,37910	0,00000	0,00000	34,09	0,00000	
BMPR2	38_PH		0,11420	0,00000	0,00000	35,29	0,00000	
BMPR2	39_PH		0,13012	0,00000	0,00000	30,00	0,00000	

BMPR2	4_NON PH		0,51127	0,00000	0,00000	29,18	0,00000	
BMPR2	40_NON PH		0,59314	0,00000	0,00000	31,39	0,00000	
BMPR2	41_PH		0,04355	0,00000	0,00000	31,77	0,00000	
BMPR2	42_PH		0,21795	0,00000	0,00000	33,13	0,00000	
BMPR2	43_NON PH		0,40695	0,00000	0,00000	31,27	0,00000	
BMPR2	44_NON PH		0,10719	0,00000	0,00000	29,77	0,00000	
BMPR2	45_PH		0,20902	0,00000	0,00000	30,96	0,00000	
BMPR2	46_NON PH		0,16081	0,00000	0,00000	32,00	0,00000	
BMPR2	47_PH		0,61688	0,00000	0,00000	29,13	0,00000	
BMPR2	48_PH		0,66090	0,00000	0,00000	28,76	0,00000	
BMPR2	49_PH		0,73009	0,00000	0,00000	27,19	0,00000	
BMPR2	5_PH		0,59065	0,00000	0,00000	28,48	0,00000	
BMPR2	50_NON PH		0,06781	0,00000	0,00000	31,95	0,00000	
BMPR2	51_NON PH		0,06285	0,00000	0,00000	30,75	0,00000	
BMPR2	52_NON PH		0,06963	0,00000	0,00000	31,31	0,00000	
BMPR2	53_NON PH		0,68962	0,00000	0,00000	28,98	0,00000	
BMPR2	54_PH		0,09030	0,00000	0,00000	36,17	0,00000	
BMPR2	55_NON PH		31,43818	0,00000	0,00000	34,99	0,00000	
BMPR2	57_PH					32,44	0,00000	
BMPR2	58_NON PH		0,03886	0,00000	0,00000	32,34	0,00000	
BMPR2	59_PH					30,06	0,00000	
BMPR2	61_PH		0,12279	0,00000	0,00000	31,10	0,00000	
BMPR2	65_PH		1,28944	0,00000	0,00000	36,48	0,00000	
BMPR2	66_NON PH					36,29	0,00000	
BMPR2	7_NON PH		0,57659	0,00000	0,00000	27,94	0,00000	
BMPR2	70_PH					39,66	0,00000	
BMPR2	72_PH		4,27632	0,00000	0,00000	32,28	0,00000	
BMPR2	73_NON PH					36,19	0,00000	
BMPR2	75_NON PH					34,13	0,00000	
BMPR2	8_PH		0,44571	0,00000	0,00000	26,60	0,00000	
BMPR2	81_PH		0,20546	0,00000	0,00000	35,09	0,00000	
BMPR2	82_NON PH		0,04633	0,00000	0,00000	32,11	0,00000	
BMPR2	83_PH		0,09221	0,00000	0,00000	28,18	0,00000	
BMPR2	84_NON PH					30,58	0,00000	
BMPR2	85_NON PH					34,15	0,00000	
BMPR2	87_PH		16,21418	0,00000	0,00000	35,07	0,00000	
BMPR2	9_PH		0,46540	0,00000	0,00000	27,49	0,00000	
BMPR2	91_NON PH					37,62	0,00000	
BMPR2	92_NON PH		6,17166	0,00000	0,00000	38,65	0,00000	
BMPR2	93_PH		2,43839	0,00000	0,00000	34,52	0,00000	
BMPR2	94_PH					33,42	0,00000	
BMPR2	95_NON PH					36,86	0,00000	
BMPR2	96_PH		37,02140	0,00000	0,00000	32,03	0,00000	
BMPR2	97_NON PH					32,31	0,00000	

BMPR2	S1_SEHAT		1,65399	0,00000	0,00000	37,82	0,00000	
BMPR2	S10_SEHAT		9,59795	0,00000	0,00000	33,27	0,00000	
BMPR2	S2_SEHAT		35,52388	0,00000	0,00000	34,26	0,00000	
BMPR2	S3_SEHAT		5,60492	0,00000	0,00000	34,62	0,00000	
BMPR2	S5_SEHAT		30,38084	0,00000	0,00000	29,83	0,00000	
BMPR2	S6_SEHAT		2,22893	0,00000	0,00000	32,32	0,00000	
BMPR2	S7_SEHAT		9,77733	0,00000	0,00000	31,41	0,00000	
BMPR2	S8_SEHAT		2,30459	0,00000	0,00000	34,17	0,00000	
BMPR2	S9_SEHAT		4,06884	0,00000	0,00000	31,31	0,00000	

Gene Expression: SOX17

Target	Sample Biological Group	Control	Expression	Expression SEM	Corrected Expression SEM	Mean Cq	Cq SEM	P-Value
ACTIN	1_PH				26,64	0,00000		
ACTIN	10_PH				25,67	0,00000		
ACTIN	101_NON PH				21,06	0,00000		
ACTIN	102_NON PH				27,48	0,00000		
ACTIN	11_PH				25,82	0,00000		
ACTIN	12_NON PH				36,27	0,00000		
ACTIN	13_PH				27,05	0,00000		
ACTIN	14_NON PH				21,34	0,00000		
ACTIN	15_PH				25,47	0,00000		
ACTIN	16_NON PH				26,87	0,00000		
ACTIN	17_NON PH				27,22	0,00000		
ACTIN	18_NON PH				25,73	0,00000		
ACTIN	19_NON PH				24,94	0,00000		
ACTIN	2_NON PH				26,32	0,00000		
ACTIN	20_PH				25,74	0,00000		
ACTIN	21_PH				25,46	0,00000		
ACTIN	26_NON PH				28,73	0,00000		
ACTIN	27_PH				24,46	0,00000		
ACTIN	28_PH				27,62	0,00000		
ACTIN	29_NON PH				28,85	0,00000		
ACTIN	3_PH				26,80	0,00000		
ACTIN	30_NON PH				26,03	0,00000		
ACTIN	31_PH				27,10	0,00000		
ACTIN	32_PH				25,36	0,00000		
ACTIN	33_PH				27,15	0,00000		
ACTIN	34_NON PH				26,05	0,00000		
ACTIN	4_NON PH				26,87	0,00000		
ACTIN	44_NON PH				31,54	0,00000		
ACTIN	45_PH				25,44	0,00000		
ACTIN	46_NON PH				28,85	0,00000		
ACTIN	47_PH				29,91	0,00000		
ACTIN	49_PH				29,33	0,00000		
ACTIN	5_PH				28,60	0,00000		
ACTIN	50_NON PH				21,24	0,00000		
ACTIN	51_NON PH				29,00	0,00000		
ACTIN	52_NON PH				28,83	0,00000		
ACTIN	53_NON PH				31,57	0,00000		
ACTIN	54_PH				38,53	0,00000		
ACTIN	55_NON PH				28,26	0,00000		
ACTIN	56_PH				32,93	0,00000		

ACTIN	57_NON PH					32,86	0,00000	
ACTIN	58_PH					36,75	0,00000	
ACTIN	59_NON PH					32,12	0,00000	
ACTIN	60_PH					31,33	0,00000	
ACTIN	61_PH					31,10	0,00000	
ACTIN	62_PH					35,06	0,00000	
ACTIN	63_PH					29,85	0,00000	
ACTIN	64_NON PH					30,60	0,00000	
ACTIN	65_PH					25,41	0,00000	
ACTIN	66_NON PH					31,63	0,00000	
ACTIN	67_PH					24,75	0,00000	
ACTIN	68_NON PH					37,07	0,00000	
ACTIN	69_NON PH					28,51	0,00000	
ACTIN	7_NON PH					28,45	0,00000	
ACTIN	70_NON PH					39,06	0,00000	
ACTIN	71_NON PH					29,79	0,00000	
ACTIN	72_PH					28,08	0,00000	
ACTIN	73_PH					28,26	0,00000	
ACTIN	74_NON PH					23,02	0,00000	
ACTIN	75_PH					19,73	0,00000	
ACTIN	76_PH					21,70	0,00000	
ACTIN	77_NON PH					24,09	0,00000	
ACTIN	78_NON PH					37,57	0,00000	
ACTIN	79_PH					38,07	0,00000	
ACTIN	8_PH					26,60	0,00000	
ACTIN	80_PH					35,47	0,00000	
ACTIN	81_PH					32,23	0,00000	
ACTIN	83_PH					35,18	0,00000	
ACTIN	84_PH					36,27	0,00000	
ACTIN	85_PH					31,43	0,00000	
ACTIN	86_PH					29,77	0,00000	
ACTIN	87_PH					34,15	0,00000	
ACTIN	88_NON PH					33,63	0,00000	
ACTIN	89_PH					36,01	0,00000	
ACTIN	9_PH					24,38	0,00000	
ACTIN	90_PH					30,86	0,00000	
ACTIN	91_NON PH					34,15	0,00000	
ACTIN	92_NON PH					38,34	0,00000	
ACTIN	97_PH					37,74	0,00000	
ACTIN	S1_SEHAT					29,84	0,00000	
ACTIN	S10_SEHAT					27,63	0,00000	
ACTIN	S2_SEHAT					27,51	0,00000	
ACTIN	S3_SEHAT					25,09	0,00000	
ACTIN	S4_SEHAT					27,27	0,00000	

ACTIN	S5_SEHAT					28,63	0,00000	
ACTIN	S6_SEHAT					28,61	0,00000	
ACTIN	S7_SEHAT					28,27	0,00000	
ACTIN	S8_PH					27,55	0,00000	
ACTIN	S9_SEHAT					29,25	0,00000	
SOX17	1_PH		0,26527	0,00000	0,00000	27,24	0,00000	
SOX17	10_PH		0,01579	0,00000	0,00000	30,34	0,00000	
SOX17	101_NON PH		0,00244	0,00000	0,00000	28,42	0,00000	
SOX17	11_PH		0,03105	0,00000	0,00000	29,52	0,00000	
SOX17	12_NON PH		0,27342	0,00000	0,00000	36,84	0,00000	
SOX17	13_PH		0,00629	0,00000	0,00000	33,05	0,00000	
SOX17	14_NON PH		0,00525	0,00000	0,00000	27,61	0,00000	
SOX17	15_PH		0,23944	0,00000	0,00000	26,22	0,00000	
SOX17	18_NON PH		0,05470	0,00000	0,00000	28,62	0,00000	
SOX17	19_NON PH		0,00518	0,00000	0,00000	31,23	0,00000	
SOX17	2_NON PH		0,29417	0,00000	0,00000	26,78	0,00000	
SOX17	20_PH		0,11245	0,00000	0,00000	27,58	0,00000	
SOX17	21_PH		0,17971	0,00000	0,00000	26,63	0,00000	
SOX17	26_NON PH		0,28842	0,00000	0,00000	29,21	0,00000	
SOX17	27_PH		0,00051	0,00000	0,00000	34,10	0,00000	
SOX17	28_PH		0,88837	0,00000	0,00000	26,48	0,00000	
SOX17	29_NON PH		0,09040	0,00000	0,00000	31,01	0,00000	
SOX17	3_PH		0,26811	0,00000	0,00000	27,39	0,00000	
SOX17	30_NON PH		0,00825	0,00000	0,00000	31,64	0,00000	
SOX17	31_PH		0,09786	0,00000	0,00000	29,14	0,00000	
SOX17	32_PH		0,00229	0,00000	0,00000	32,83	0,00000	
SOX17	33_PH		0,03015	0,00000	0,00000	30,90	0,00000	
SOX17	34_NON PH		0,01285	0,00000	0,00000	31,02	0,00000	
SOX17	35_PH					27,19	0,00000	
SOX17	36_PH					27,87	0,00000	
SOX17	37_PH					29,77	0,00000	
SOX17	38_PH					30,99	0,00000	
SOX17	39_PH					28,40	0,00000	
SOX17	4_NON PH		0,15250	0,00000	0,00000	28,27	0,00000	
SOX17	40_NON PH					31,36	0,00000	
SOX17	41_PH					29,52	0,00000	
SOX17	42_PH					31,54	0,00000	
SOX17	43_NON PH					32,88	0,00000	
SOX17	44_NON PH		5,56224	0,00000	0,00000	27,75	0,00000	
SOX17	45_PH		0,01636	0,00000	0,00000	30,07	0,00000	
SOX17	46_NON PH		0,01497	0,00000	0,00000	33,61	0,00000	
SOX17	48_PH					27,19	0,00000	
SOX17	49_PH		0,41462	0,00000	0,00000	29,29	0,00000	
SOX17	5_PH		0,06260	0,00000	0,00000	31,29	0,00000	

SOX17	56_NON PH					35,86	0,00000	
SOX17	59_PH					37,38	0,00000	
SOX17	62_NON PH					37,56	0,00000	
SOX17	64_PH					39,18	0,00000	
SOX17	65_PH		0,00043	0,00000	0,00000	35,29	0,00000	
SOX17	66_NON PH		0,00862	0,00000	0,00000	37,18	0,00000	
SOX17	67_PH		0,00158	0,00000	0,00000	32,74	0,00000	
SOX17	68_NON PH		0,62749	0,00000	0,00000	36,44	0,00000	
SOX17	7_NON PH		3,35113	0,00000	0,00000	25,40	0,00000	
SOX17	70_PH					38,55	0,00000	
SOX17	71_NON PH		0,00052	0,00000	0,00000	39,38	0,00000	
SOX17	72_PH		0,00011	0,00000	0,00000	39,91	0,00000	
SOX17	73_NON PH					35,36	0,00000	
SOX17	74_NON PH		0,00034	0,00000	0,00000	33,25	0,00000	
SOX17	75_NON PH					28,25	0,00000	
SOX17	76_NON PH					31,13	0,00000	
SOX17	77_NON PH		0,00160	0,00000	0,00000	32,06	0,00000	
SOX17	79_PH		0,55318	0,00000	0,00000	37,62	0,00000	
SOX17	8_PH		0,01491	0,00000	0,00000	31,36	0,00000	
SOX17	80_NON PH					37,08	0,00000	
SOX17	82_NON PH					39,77	0,00000	
SOX17	83_PH		0,18515	0,00000	0,00000	36,31	0,00000	
SOX17	84_NON PH					30,82	0,00000	
SOX17	85_NON PH					36,81	0,00000	
SOX17	86_NON PH					35,68	0,00000	
SOX17	87_PH		0,04900	0,00000	0,00000	37,19	0,00000	
SOX17	89_NON PH					38,59	0,00000	
SOX17	9_PH		0,00556	0,00000	0,00000	30,56	0,00000	
SOX17	90_NON PH					35,02	0,00000	
SOX17	91_NON PH		0,00893	0,00000	0,00000	39,65	0,00000	
SOX17	92_NON PH		6,37338	0,00000	0,00000	34,36	0,00000	
SOX17	93_PH					36,94	0,00000	
SOX17	94_PH					33,16	0,00000	
SOX17	98_NON PH					36,23	0,00000	
SOX17	S1_SEHAT		1,11961	0,00000	0,00000	28,37	0,00000	
SOX17	S10_SEHAT		0,34725	0,00000	0,00000	27,85	0,00000	
SOX17	S2_SEHAT		0,12784	0,00000	0,00000	29,17	0,00000	
SOX17	S3_SEHAT		0,31515	0,00000	0,00000	25,45	0,00000	
SOX17	S4_SEHAT		2,62442	0,00000	0,00000	24,57	0,00000	
SOX17	S5_SEHAT		2,01629	0,00000	0,00000	26,31	0,00000	
SOX17	S6_SEHAT		0,97673	0,00000	0,00000	27,34	0,00000	
SOX17	S7_SEHAT		3,38353	0,00000	0,00000	25,21	0,00000	
SOX17	S8_PH		0,20326	0,00000	0,00000	28,54	0,00000	
SOX17	S9_SEHAT		3,65083	0,00000	0,00000	26,08	0,00000	

REKOMENDASI ETIK PENELITIAN



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN
KOMITE ETIK PENELITIAN UNIVERSITAS HASANUDDIN
RSPTN UNIVERSITAS HASANUDDIN
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR
Sekretariat : Lantai 2 Gedung Laboratorium Terpadu
JL.PERINTIS KEMERDEKAAN KAMPUS TAMALANREA KM.10 MAKASSAR 90245.
Contact Person: dr. Agussalim Bukhari.,MMed,PhD, SpGK TELP. 081241850858. 0411 5780103. Fax : 0411-581431



REKOMENDASI PERSETUJUAN ETIK

Nomor : 863/UN4.6.4.5.31/ PP36/ 2023

Tanggal: 13 Nopember 2023

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH23090626	No Sponsor	
Peneliti Utama	dr. Yulius Patimang Sp.A, Sp.JP(K)	Sponsor	
Judul Peneliti	PROFIL KLINIS, PROGNOSIS, SERTA GAMBARAN POLIMORFISME GENETIK BMRP-2 DAN SOX-17 PASIEN HIPERTENSI PULMONAL DENGAN PENYAKIT JANTUNG KONGENITAL DI INDONESIA		
No Versi Protokol	2	Tanggal Versi	7 Nopember 2023
No Versi PSP	2	Tanggal Versi	7 Nopember 2023
Tempat Penelitian	RSUP Dr Wahidin Sudirohusodo Makassar		
Jenis Review	<input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard Tanggal	Masa Berlaku 13 Nopember 2023 sampai 13 Nopember 2024	Frekuensi review lanjutan
Ketua KEP Universitas Hasanuddin	Nama Prof. dr. Muh Nasrum Massi, PhD, SpMK, Subsp. Bakt(K)	Tanda tangan	
Sekretaris KEP Universitas Hasanuddin	Nama dr. Firdaus Hamid, PhD, SpMK(K)	Tanda tangan	

Kewajiban Peneliti Utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Lapor SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari protokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan